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New data of *Hahnia* (Araneae: Hahniidae) in Japan, with a description of a new species

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Abstract — Up to the present, four *Hahnia* species are known from Japan:. *H. corticicola, H. martialis, H. nava* and *H. pinicola*. Further two species are newly recognized in Japan. One is new to science, described as *Hahnia tanikawai* sp. nov. The other, *H. thorntoni* is newly recorded from Japan. These two species are easily distinguishable from the other congeners by their copulatory organs.

Key words — Taxonomy, Kagoshima Pref., Okinawa Pref.

Hahnia C. L. Koch 1841 is the largest hahniid genus which is widely distributed in temperate zones except Australasia, and is including 100 species at present (World Spider Catalog 2014). In Japan, four species have been known: *H. corticicola, H. martialis, H. nava* and *H. pinicola.* However, no species of this genus have been recorded from Ryukyu Isls. After examining the materials from Kagoshima and Okinawa Prefs., I recognized the occurrence of two unknown *Hahnia* species. One species is new to science. The other, *H. thorntoni* Brignoli 1982 has been recorded only from China and Laos (Jäger & Praxaysombath 2011, Zhang & Zhang 2013). Here, I present the morphological characteristics of these species.

Specimens were preserved in 80% ethanol, and their morphological features were observed under Olympus SZH10 stereomicroscope. The voucher specimens are deposited in the collection of the Department of Zoology, National Museum of Nature and Science, Tokyo.

The following abbreviations are used: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye; MOA, median ocular aria; RTA, retrolateral tibial apophysis.

Measurement is given in mm, measurement in parenthesis indicate the range among specimens examined. Measurement of legs is given in the following format: [femur + patella + tibia + metatarsus + tarsus = total].

Genus *Hahnia* C. L. Koch 1841

[Japanese name: Hatakegumo-zoku]

Hahnia tanikawai sp. nov.

[Japanese name: Iriomote-hatakegumo]

(Figs. 1–7)

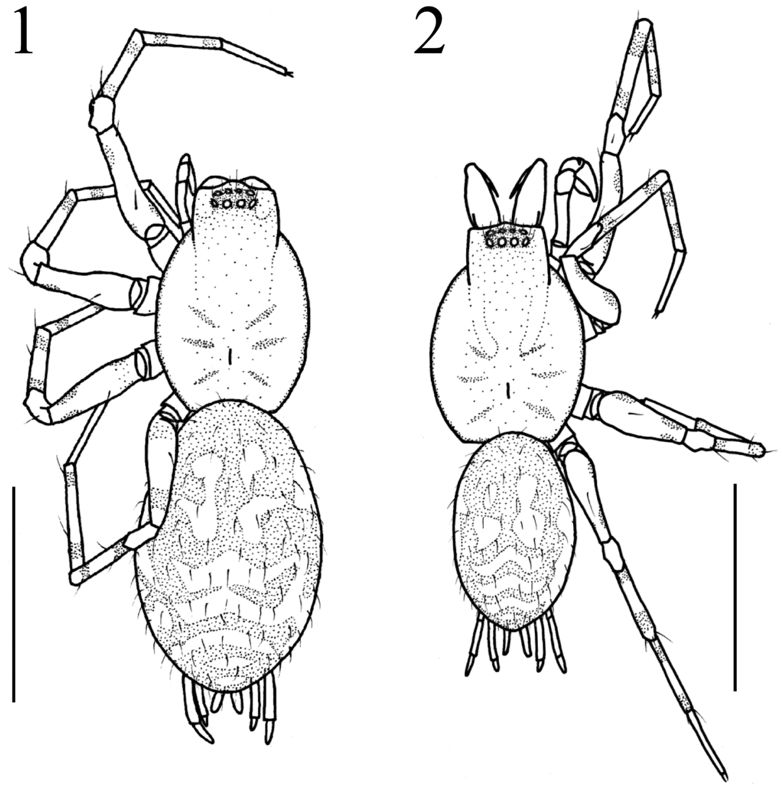
Type series. All of the type series were collected in Iriomotejima Is., Okinawa Pref., Japan by A. Tanikawa. Holotype: ♀, Ôtomi, 29-III-1988 (NSMT-Ar 13330). Paratypes: 3♂1♀, Komi, 3-I-1989 (1♂), 3-I-1990 (2♂1♀) (NSMT-Ar 13331–13334); 1♀, same data as the holotype (NSMT-Ar 13335); 1♀, Ôhara, 30-XII-1986 (NSMT-Ar 13336).

Other specimens examined. 1 ♀, Mantabaru forest park, Yonagunijima Is., Okinawa Pref., Japan, 1-III-2004, Y. G. Baba leg. Other than this female, all the specimens were collected in Iriomotejima Is., Okinawa Pref., Japan by A. Tanikawa. 2♀, Funaura, 5-I-1988; 6♀, Sonai, 5-I-1988 (2♀), 1-I-1989 (3♀), 27-III-1989 (1♀); 5♂11♀, Komi, 3-I-1988 (2♀), 3-I-1989 (2♂), 30-III-1989 (2♀), 3-I-1990 (3♂4♀), 1-I-1991 (3♀); 7♀, Otomi, 2-I-1981 (2♀), 28-III-1986 (4♀), 29-III-1988 (1♀).

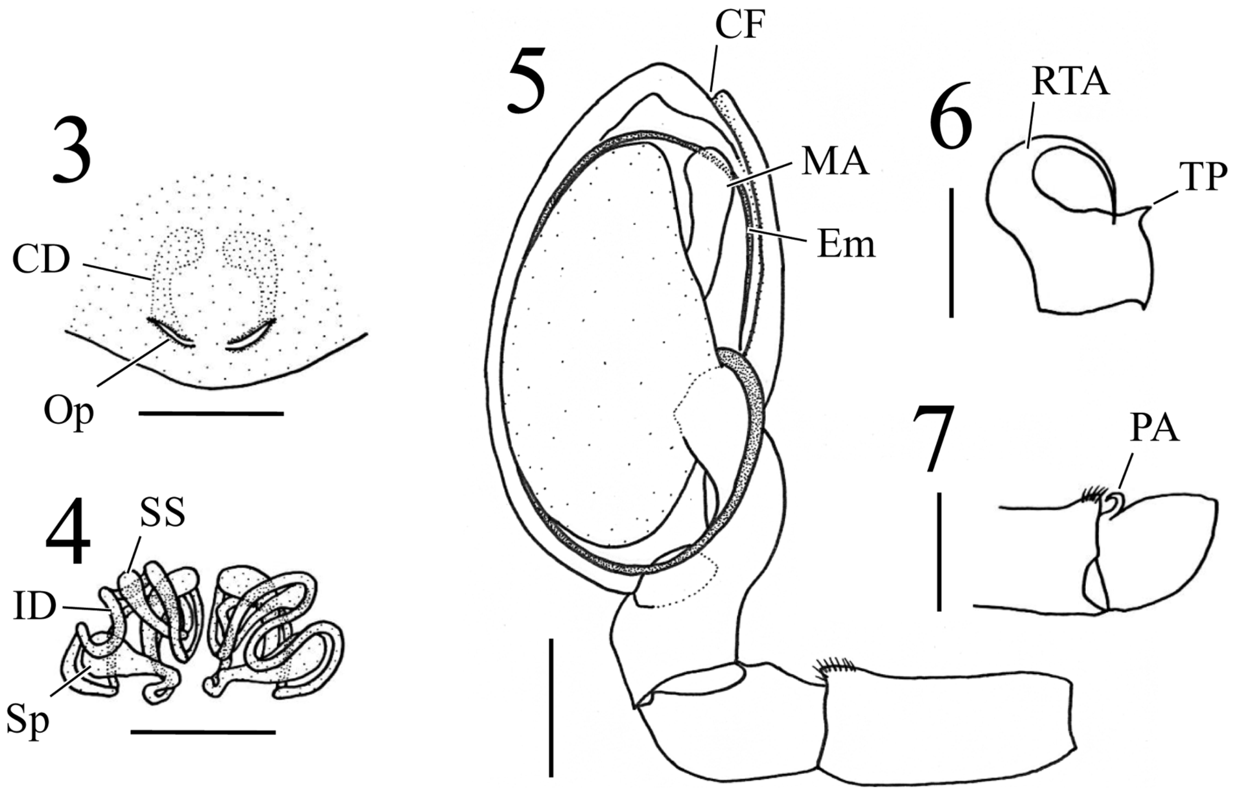
Diagnosis. This species closely resembles *H. zhejiangensis* Song & Zheng 1982, but can be distinguished from the latter by epigyne with a pair of slit-like openings on the rear (Fig. 3) and by male palp with ventro-distal protuberance on femur, long RTA and small dorsal protuberance on tibia (Figs. 6–7).

Compared with other Japanese *Hahnia* species, this species can be easily distinguished by epigyne with combination of slit-like openings and thick longitudinal copulatory ducts (Fig. 3), and male palp with small patellar apophysis and ventro-distal protuberance of femur (Figs. 5, 7).

Description. *Female* (NSMT-Ar 13330, holotype, Fig. 1). Measurement. Body 2.76 (2.28–3.30) long; carapace 1.24 (1.00–1.42) long; 0.86 (0.72–1.00) wide; abdomen 1.52 (1.28–1.88) long; 1.02 (0.86–1.44) wide. Eye size and interdistance: AME 0.03 (0.03–0.05), ALE 0.08 (0.07–0.10), PME 0.08 (0.07–0.08), PLE 0.07 (0.07–0.10); AME-AME 0.02 (0.02–0.04), AME-ALE 0.02 (0.02–0.02), PME-PME 0.07 (0.05–0.07), PME-PLE 0.08 (0.04–0.08), ALE-PLE 0.01 (0.01–0.01); MOA 0.17 (0.15–0.18) long, front width 0.09 (0.09–0.14), behind width 0.19 (0.18–0.23). Clypeus 0.11 (0.11–0.15) high. Length of legs: I 0.96 + 0.38 + 0.80 + 0.72 + 0.52 = 3.38; II 0.90 + 0.38 +



Figs. 1–2. *Hahnia tanikawai* sp. nov. 1–2, dorsal view. 1, female (NSMT-Ar 13330); 2, male (NSMT-Ar 13331). Scales = 1.0 mm.



Figs. 3–7. *Hahnia tanikawai* sp. nov. 3, epigyne; 4, endogyne; 5–7, male palp. 5, ventral view; 6, tibia, retrolateral view; 7, patella and distal end of femur, retrolateral view. (3–4, NSMT-Ar 13330; 5–7, NSMT-Ar 13331.) Abbreviations: CD, copulatory duct; CF, cymbial furrow; Em, embolus; ID, insemination duct; MA, median apophysis; Op, opening; PA, patellar apophysis; RTA, rterolateral tibial apophysis; Sp, spermatheca; SS, Second spermatheca; TP, tibial process. Scales = 0.2 mm.

0.68 + 0.64 + 0.48 = 3.08; III 0.80 + 0.34 + 0.58 + 0.64 + 0.46 = 2.82; IV 1.04 + 0.40 + 0.82 + 0.80 + 0.56 = 3.62.

Carapace length/width 1.44 (1.39–1.44). Labium longer than wide, length/width 1.50 (1.40–1.69). Sternum almost as long as wide, length/width 0.97 (0.97–1.04). Chelicera with 3 promarginal and 6 retromarginal teeth.

Copulatory organ (Figs. 3–4). Epigyne with a pair of slit-like openings on the rear. Copulatory ducts thick and longitudinal. Insemination ducts long and meandering. Spermatheca pear-shaped, located posteriorly and transversally. Second spermatheca slender.

Coloration and markings (Fig. 1). Carapace mostly brown, rather darker on head and middle of thorax, bearing several radial dark markings on thorax. Surrounding of eyes black and with long hairs. Chelicera brown. Labium, maxilla and sternum tinged with grey. Dorsum of abdomen mostly dark greyish brown, covered with sparse same-colored hairs, bearing paired spots and several chevrons of bright greyish brown, not-pigmented part. Venter of abdomen greyish brown, covered with sparse same-colored hairs. Spinnerets greyish brown. Legs mostly bright brown, ventrally with several obscure dark markings on basal and distal part of femora, tibiae and metatarsi. Palp bright brown.

Male (NSMT-Ar 13331, one of paratypes, Fig. 2). Measurement. Body 2.44 (1.82–2.44) long; carapace 1.18 (0.96–1.24) long; 0.86 (0.72–0.92) wide; abdomen 1.26 (0.86–1.26) long; 0.80 (0.64–0.80) wide. Eye size and interdistance: AME 0.04 (0.03–0.05), ALE 0.08 (0.08–0.08), PME 0.08 (0.06–0.08), PLE 0.08 (0.06–0.08); AME-AME 0.02 (0.02–0.02), AME-ALE 0.01 (0.01–0.02), PME-PME 0.06 (0.06–0.06), PME-PLE 0.04 (0.04–0.04), ALE-PLE 0.01 (0.01–0.01); MOA 0.17 (0.13–0.19) long, front width 0.12 (0.10–0.13), behind width 0.20 (0.18–0.20). Clypeus 0.13 (0.09–0.13) high. Length of legs: I 0.94 + 0.38 + 0.80 + 0.74 + 0.56 = 3.42; II 0.86 + 0.36 + 0.68 + 0.64 + 0.54 = 3.08; III 0.78 + 0.32 + 0.60 + 0.70 + 0.48 = 2.88; IV 1.02 + 0.38 + 0.80 + 0.84 + 0.60 = 3.64.

Carapace length/width 1.37 (1.33–1.37). Labium longer than wide, length/width 1.57 (1.43–1.80). Sternum almost as long as wide, length/width 0.94 (0.94–1.04). Chelicera with 3 promarginal and 8 (on right chelicera, 7 on left one; 6–8 among paratypes) retromarginal teeth, and bearing stridulatory files on lateral surface.

Palp (Figs. 5–7). Femur with ventral process covered by thick hairs on distal end. Patellar apophysis very small. Tibia with long RTA and small dorsal spine-like process. Embolus filiform, originating at retrobasal corner (3 o'clock), and encircling bulb medially. Median apophysis distinct. Cymbial furrow slightly shorter than cymbium.

Coloration and markings (Fig. 2). Generally as female. Palp mostly bright brown except black embolus.

Distribution. Japan: Okinawa Pref. (Iriomotejima Is., Yonagunijima Is.)

Remarks. Males and females are considered conspecific because no other candidates were collected in Iriomotejima Is., where the type locality is.

Etymology. This species is dedicated to Dr. Akio Tanikawa, University of Tokyo, who collected specimens of type series and many others.

Hahnia thorntoni Brignoli 1982
[Japanese name: Satsuma-hatakegumo]
(Figs. 8–14)

Hahnia thorntoni Brignoli 1982, p. 346, f. 13–14 [♂ holotype (from China: Hong Kong, deposited in Natural History Museum, London, not examined); ♂ paratype (from China: Hong Kong) misidentified = *H. zhejiangensis*]; Zhang & Zhang 2013, p. 525, f. 3A–E, 4A–I, 5A–C, 6A–G, 7A–D, ♂♀.

Hahnia yueluensis Yin & Wan 1983, p. 143, f. 8–10 [♀ holotype (from China: Hunan Prov.); ♂ paratype (from China: Hunan) misidentified = *H. zhejiangensis*]; Song 1987, p. 202, f. 161A–B [only ♀]; Chen & Gao 1990, p. 121, f. 150a [only ♀]; Song et al. 1999, p. 362, f. 211B–C [only ♀]; Yin et al. 2012, p. 960, f. 487b–c, ♀.

Hahnia maginii: Song 1987, p. 199, f. 157, ♀; Song et al. 1999, p. 361, f. 210Q–R, ♀. [nec Brignoli 1977, misidentificaion]

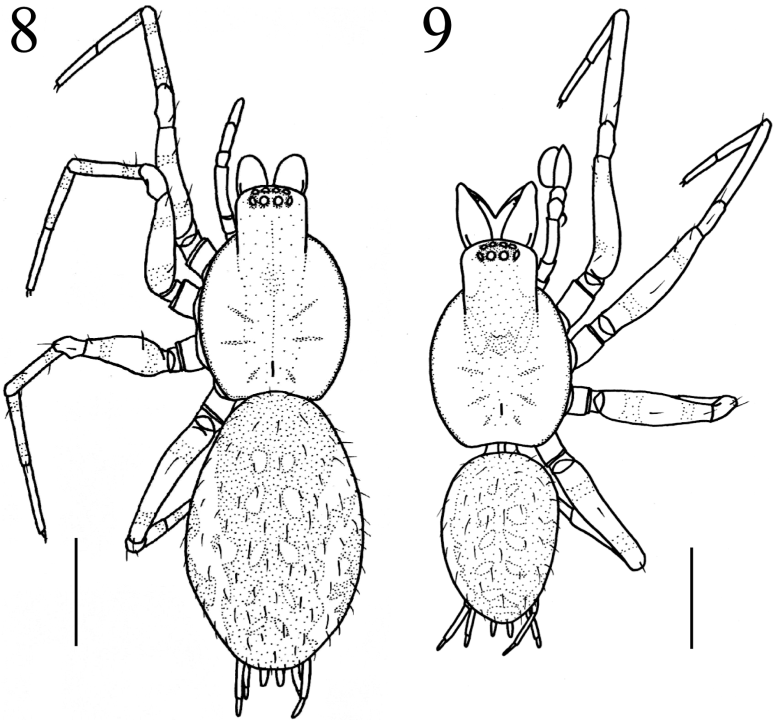
Hahnia flagellifera Zhu et al. 1989, p. 148, f. 1–6, ♂♀; Chen & Gao 1990, p. 119, f. 149a–f, ♂♀; Song et al. 1999, p. 361, f. 210I–J, 211 J–K, ♂♀; Zhang et al. 2011, p. 9, f. 6A–C, 7A–D, 8A–I, 9A–G, ♂♀.

Specimens examined. All the specimens were collected in Japan. Kagoshima Pref.: 3♂2♀ (1♂: NSMT-Ar 13338, 1♀: NSMT-Ar 13337), Hashimashirahama, Ichikikushikino-shi, 21-X-2013, T. Suguro leg.; 1♂, southern village, Suwanosejima Is., Tokara Isls., 27-X-2012, T. Suguro leg.; 3♂3♀, eastern village, Nakanoshima Is., Tokara Isls., 29-X-2012, T. Suguro leg.; 1♀, Ichi, Sumiyô-son, Amami-Ôshima Is., 31-XII-1995, A. Tanikawa leg.; 3♀, Ôyama, China-chô, Okinoerabu Is., 13-III-2013, T. Suguro leg. Okinawa Pref.: 1♀, northern village, Tokashikijima Is., 10-III-2005, Y. G. Baba leg.

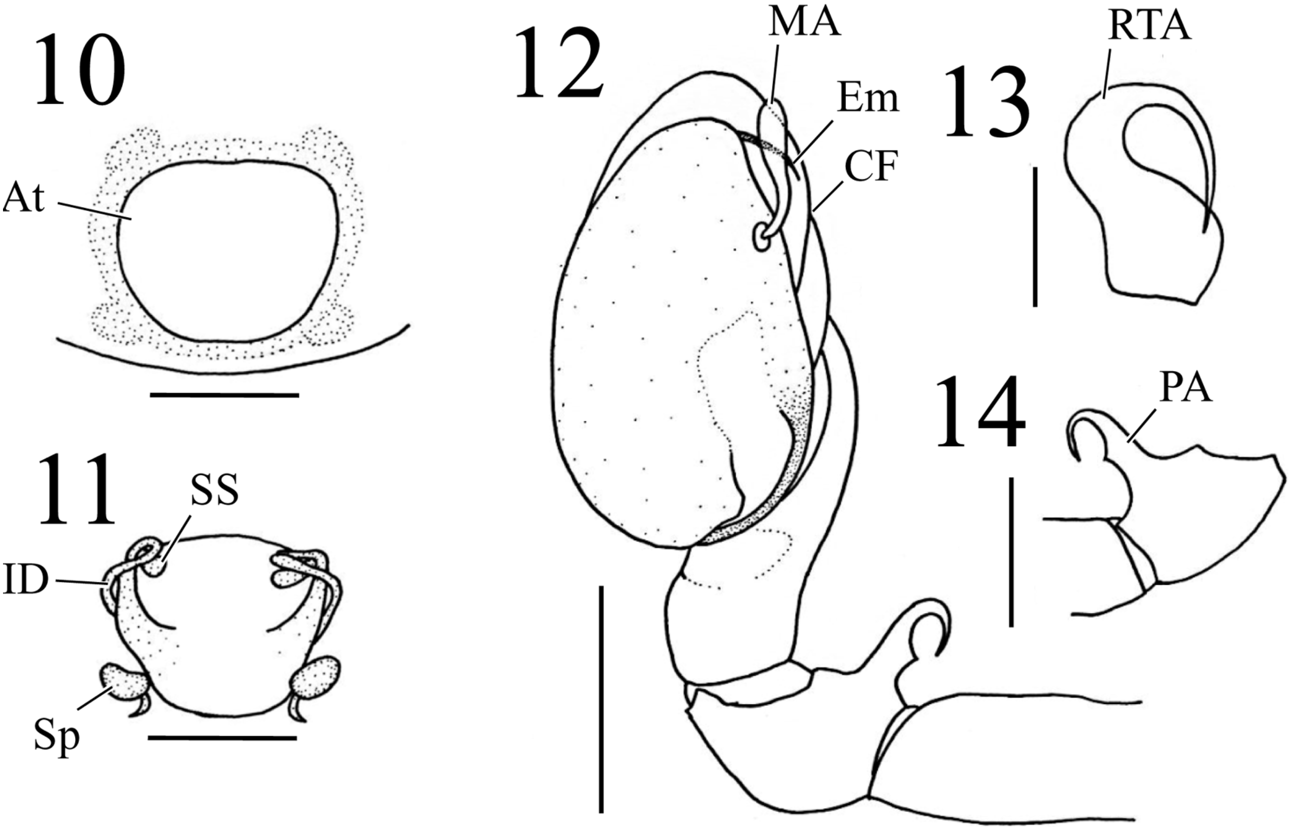
Diagnosis. Compared with other Japanese *Hahnia* species, this species can be easily distinguished by epigyne with large round atrium (Figs. 10), and male palp with large strong patellar apophysis (Figs. 12, 14).

Description. Based on 1♀ (NSMT-Ar 13337, Fig. 8) and 1♂ (NSMT-Ar 13338, Fig. 9) from Japan.

Female. Measurement. Body 3.66 (2.66–3.66) long; carapace 1.54 (1.24–1.66) long; 1.06 (0.86–1.16) wide; abdomen 2.12 (1.42–2.12) long; 1.52 (1.04–1.52) wide. Eye size and interdistance: AME 0.07 (0.06–0.07), ALE 0.09 (0.08–0.09), PME 0.09 (0.08–0.09), PLE 0.10 (0.08–0.11); AME-AME 0.03 (0.02–0.06), AME-ALE 0.02 (0.01–0.02), PME-PME 0.08 (0.06–0.08), PME-PLE 0.06 (0.06–0.06), ALE-PLE 0.02 (0.02–0.03); MOA 0.20 (0.17–0.20) long, front width 0.18 (0.15–0.19), behind width 0.26 (0.19–0.26). Clypeus 0.13 (0.10–0.13) high. Length of legs: I 1.22 + 0.50 + 0.96 + 0.92 + 0.58 = 4.18; II 1.14 + 0.48 +



Figs. 8–9. *Hahnia thorntoni* Brignoli 1982. 8–9, dorsal view. 8, female (NSMT-Ar 13337); 9, male (NSMT-Ar 13338). Scales = 1.0 mm.



Figs. 10–14. *Hahnia thorntoni* Brignoli 1982. 10, epigyne; 11, endogyne; 12–14, male palp. 12, ventral view; 13, tibia, retrolateral view; 14, patella and distal end of femur, retrolateral view. (10–11, NSMT-Ar 13337; 12–14, NSMT-Ar 13338.) Abbreviations: At, atrium; CD, copulatory duct; CF, cymbial furrow; Em, embolus; ID, insemination duct; MA, median apophysis; PA, patellar apophysis; RTA, rterolateral tibial apophysis; Sp, spermatheca; SS, Second spermatheca. Scales = 0.2 mm.

0.86 + 0.86 + 0.54 = 3.88; III 1.02 + 0.44 + 0.74 + 0.80 + 0.54 = 3.54; IV 1.30 + 0.48 + 1.06 + 1.12 + 0.64 = 4.60.

Carapace length/width 1.45 (1.43–1.45). Labium longer than wide, length/width 1.30 (1.30–1.38). Sternum almost as long as wide, length/width 0.91 (0.91–1.00). Chelicera with 3 promarginal and 6 (on right chelicera, 5 on left one; 5–8 among specimens examined) retromarginal teeth.

Copulatory organ (Figs. 10–11). Epigyne with large round atrium. Insemination duct short and running beside depression. Spermatheca small and round, located posteriorly. Second spermatheca small, located anteriorly.

Coloration and markings (Fig. 8). Carapace mostly bright brown, tinged with grey on head, middle of thorax and lateral margin, bearing several radial dark markings on thorax. Surrounding of eyes black and with long hairs. Chelicera rather darker brown. Labium, maxilla and sternum bright brown. Dorsum of abdomen mostly dark greyish brown, covered with sparse black hairs, with several paired bright greyish brown spots of not-pigmented part. Venter of abdomen greyish brown, covered with sparse same-colored hairs. Spinnerets greyish brown. Legs mostly bright brown, ventrally with several obscure dark markings on basal and distal part of femora, tibiae and metatarsi, and distal end of patellae. Palp bright brown.

Male. Measurement. Body 3.12 (2.60–3.44) long; carapace 1.52 (1.22–1.74) long; 1.08 (0.88–1.22) wide; abdomen 1.60 (1.38–1.70) long; 1.10 (1.00–1.22) wide. Eye size and interdistance: AME 0.07 (0.06–0.07), ALE 0.09 (0.07–0.10), PME 0.09 (0.07–0.10), PLE 0.10 (0.08–0.11); AME-AME 0.04 (0.02–0.04), AME-ALE 0.01 (0.01–0.02), PME-PME 0.08 (0.04–0.08), PME-PLE 0.06 (0.03–0.08), ALE-PLE 0.01 (0.01–0.02); MOA 0.20 (0.16–0.20) long, front width 0.18 (0.13–0.19), behind width 0.18 (0.15–0.19). Clypeus 0.15 (0.10–0.17) high. Length of legs: I 1.32 + 0.62 + 1.30 + 1.00 + 0.62 = 4.86; II 1.24 + 0.48 + 0.98 + 0.98 + 0.58 = 4.26; III 1.02 + 0.40 + 0.74 + 0.88 + 0.58 = 3.62; IV 1.26 + 0.46 + 1.04 + 1.12 + 0.68 = 4.56.

Carapace length/width 1.41 (1.39–1.43). Labium rather longer than wide, length/width 1.18 (1.11–1.18). Sternum as long as wide, length/width 0.98 (0.98–1.02). Chelicera longer than female, with 3 promarginal and 5 (on right chelicera, 7 on left one; 5–8 among specimens examined) retromarginal teeth, bearing stridulatory files on lateral surface.

Palp (Figs. 12–14). Patellar apophysis large and with middle apex on patellar basal side. Tibia with long RTA, lacking dorsal process. Embolus spiniform, originating at retrobasal corner (4 o'clock), and encircling bulb medially. Median apophysis thin and membranous. Cymbial furrow originating at nearly middle of cymbium.

Coloration and markings (Fig. 9). Generally as female. Palp mostly bright brown except dark greyish brown cymbium and black embolus.

Distribution. Japan (new record): Kagoshima and Okinawa Prefs.; South China, Laos.

Remarks. Compared with Chinese specimens of this species (Zhang et al. 2011), Japanese ones are rather larger in body size. However, the other characters are almost the same between Chinese and Japanese specimens. Therefore, I identified Japanese specimens as this species.

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